ISSN (print) 0093-4666 © 2011. Mycotaxon, Ltd. ISSN (online) 2154-8889

MYCOTAXON

Volume 115, pp. 45–52 *January–March 2011*

DOI: 10.5248/115.45

Studies in lichens and lichenicolous fungi: 7. More notes on taxa from North America

James C. Lendemer*[1] & Kerry Knudsen[2]

[1]*Cryptogamic Herbarium, Institute of Systematic Botany, The New York Botanical Garden, Bronx, NY 10458-5126, USA*

[2]*The Herbarium, Dept. of Botany & Plant Sciences, University of California, Riverside, CA 92521-0124, USA*

Correspondence to *: [1]*jlendemer@nybg.org* & [2]*knudsen@ucr.edu*

Abstract— *Acarospora complanata*, *Fellhaneropsis myrtillicola*, and *Lecanora stramineoalbida* are reported new for North America north of Mexico. *Acarospora superfusa* is confirmed as occurring in North America. *Biatorella rappii* is placed in synonymy with *Ramonia microspora*.

Key words— Appalachian Mountains, Magnusson, Sonoran Desert, SE coastal plain.

1. ***Acarospora complanata*** H. Magn., Svensk. Bot. Tidskr. 18: 332. 1924.

Type: France. Provence-Alpes-Côte D'azur: Var Dist., Massif volcanique de la Courtine, pres Ollisules, 1923, *de Crozals* (hb. B. de Lesd.[n.v.-presumed destroyed], holotype; UPS! isotype).

Acarospora complanata was described from France (Magnusson 1924) and Magnusson recognized it as occurring in Africa and Mexico (Magnusson 1929, 1956). The species forms a brown areolate orbicular thallus with inconspicuous immersed apothecia and an effigurate margin with narrow lobes, a hymenium 80–90 µm high, paraphyses at mid-height mostly 2–2.5 µm in diameter, and a cortex that contains gyrophoric and lecanoric acids (KC+ pink). For a fuller description see Magnusson (1929).

Morphologically, the species does not appear related to *A. molybdina* (Wahlenb.) Trevis, *A. macrocyclos* Vain., or *A. wahlenbergii* H. Magn., which have thicker rugulose thalli, thinner paraphyses, and pseudo-lecanorine apothecia often in convex areoles. Instead, *A. complanata* appears morphologically more closely related to *A. trachyticola* (Müll. Arg.) Hue, currently known only from Peru (Magnusson 1929), from which it differs mainly in having a lower

hymenium (80–90 vs. 100–120 µm) and producing gyrophoric and lecanoric acids (absent in *A. trachyticola*).

The concept of *Acarospora complanata* as revised by Clauzade & Roux (Clauzade et al. 1981) differs from Magnusson's concept of the species (Magnusson 1929), which is the species concept used here. *Acarospora complanata* sensu Magnusson (1929) has a thallus that reacts KC+ pink (gyrophoric and lecanoric acids), but Clauzade & Roux (Clauzade et al. 1981) synonymized seven species with *A. complanata* that all lack these substances. These authors probably included more than one taxon in their concept of *A. complanata* and a revision of their material is needed.

Acarospora complanata was included in the checklist of lichens of North America north of Mexico (Egan 1987) because *A. obscura* H. Magn., which was reported by Magnusson (1956) from California, was one of the seven species synonymized with *A. complanata* by Clauzade & Roux (Clauzade et al. 1981). The type specimen of *A. obscura* was collected in Mexico and was in the herbarium of Bouly de Lesdain. It is presumed to be lost, but Magnusson (1929, 1956) treated *A. obscura* as a C– and KC–, species with a non-effigurate and non-orbicular thallus. The one specimen identified as *A. obscura* by Magnusson that was seen during the Sonoran Flora Project, was actually *A. veronensis* A. Massal. (Knudsen 2008).

Bruce McCune collected *A. complanata* s. str. in Montana just west of Pine Butte Swamp in the limestone steppes and we here report the species as new to North America north of Mexico. The McCune specimen is overgrowing another lichen, but the behavior appears competitive (for space) rather than parasitic.

North American specimen examined— **U.S.A. Montana. Teton Co.:** 47°50'N, 112°36'W, 1480 m, on limestone outcrops, viii.1985, *McCune 15165* (hb. McCune).

2. ***Acarospora superfusa*** H. Magn., Meddel. Göteborgs Bot. Trädgård 5: 65. 1930.

Type: U.S.A. New Mexico: Las Vegas, 2000 m., 1927, *Brouard* (hb. de Lesd. [n.v.-presumed destroyed], holotype; UPS!, isotype).

During the Sonoran Flora Project, a small number of specimens of *Acarospora superfusa* were seen, including the isotype. These were distinctly pruinose and broadly attached to the substrate because the specimens were predominately reduced or young and, consequently, Knudsen (2008) included *A. superfusa* within a broad concept of *A. veronensis*.

The study of additional, recently collected specimens led to the observation that unlike *Acarospora veronensis,* mature specimens of *A. superfusa* have larger pruinose areoles (0.5–1.5 vs. 0.2-0.5 µm) and one apothecium per areole (rather than up to six smaller apothecia) (Magnusson 1929, 1930; Knudsen 2008) The

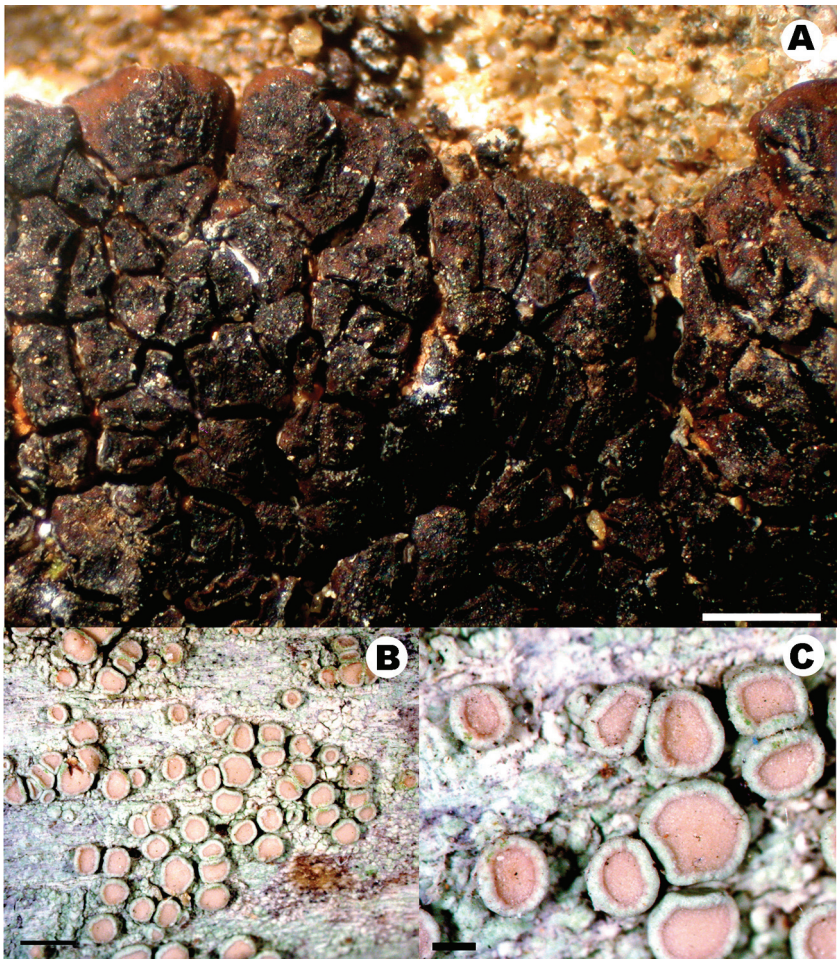

FIGURE 1. A, *Acarospora complanata* (McCune 15165, scale = 1.0 mm). B-C, *Lecanora stramineoalbida* (Lendemer 20785, scale = 1.0 mm and 0.25 mm respectively).

areoles of *A. superfusa* become gomphate (i.e., have an elongated mycelial base), and eventually lobulate and squamulose, developing a short stout stipe half the width of the squamule, rather than remaining broadly attached to the substrate as in *A. veronensis.* Otherwise, as observed by Magnusson (1930), in terms of cortical measurements, etc., *A. superfusa* is similar to *A. veronensis*.

Acarospora superfusa can also be confused with *A. nicolai* B. de Lesd. or pruinose specimens of *A. obpallens* (Nyl. ex Hasse) Zahlbr. However, both species produce gyrophoric and lecanoric acids. Thalli of *A. obpallens* further

differ by the presence of faveoles (Knudsen 2008), while *A. nicolai* differs in not becoming squamulose (Knudsen & Morse 2009). All three of the above species are sympatric from the Greater Sonoran Desert Region eastward to Oklahoma in the Great Plains.

Acarospora versicolor Bagl. & Carestia, which occurs in Europe and Siberia (Magnusson 1929; Clauzade et al. 1981), also appears to be closely related to *A. superfusa*, but has a higher hymenium on average (100–110 vs. 80–90 µm), a slightly thicker cortex, and narrower paraphyses (1.0–1.5 vs. 1.8–2.5 µm).

While revising specimens at the Farlow Herbarium (FH) a specimen of *Acarospora superfusa* from New Mexico was discovered that Magnusson had identified as *A. cinereoalba* (Fink) H. Magn. Based on this evidence it is likely that all the reports of *A. cinereoalba* from New Mexico by Magnusson (1930) are *A. superfusa*. *Acarospora cinereoalba* was originally described by Fink (1899) from Illinois and Minnesota as a variety of *A. cervina* (Ach.) A. Massal. We consider *A. cinereoalba* to be a pruinose morphotype of *A. veronensis*. While such pruinose specimens of *A. veronensis* are rare in North America they do occur, especially near waterfalls or on rocks were water settles and evaporates. Specimens of *A. superfusa* that are young or reduced and have not become gomphate or stipitate may be indistinguishable from pruinose forms of *A. veronensis*.

The protologue of *Acarospora superfusa* (Magnusson 1930) does not include an etymology. It is not known what Magnusson meant by the inclusion of "fusa" in the epithet. While he might have meant "fusca" (brown) alluding to a similarity to *Acarospora fusca* B. de Lesd., he nonetheless retained the original spelling 26 years later (Magnuson 1956) and we do the same here.

Specimens examined— **Canada. Saskatchewan:** Rural Municipality of Waverley No. 44, Grasslands National Park, eroded bluff overlooking McGowan Creek Valley, on acidic rock, 49°03'54"N, 106°31'27"W, 899 m, 19.vi.2009, *Freebury 859* (hb. Freebury); eroded hilltop on mixed-grass prairie, on acidic sandstone, 898 m, 12.ix.2009, *Freebury 999* (hb. Freebury). **U.S.A. California. San Bernardino Co.:** San Bernardino Mountains, Clark Mountains, east edge of wash south of Pachalka Springs, 35°30'44" N, 115°37'17"W, 1548 m, on Hcl- boulder, rare, 11.x.2009, *Knudsen 11769 & Pietrasiask* (UCR). **San Diego Co.:** Anza Borrego Desert State Park, Plum Canyon, 33°06'28"N, 116°25'43"W, 688 m, on granite boulder in wash, rare, 22.ix.2005, *Knudsen 3665 & Marsden* (UCR). **Oklahoma. Greer Co.:** Quartz Mountain Arts & Conference Center, along New Horizon Trail, 34°53'35"N, 99°18'05"W, 482–588 m, on pink granite outcrops, 10.iv.2007, *Morse 15048 & Ladd* (KANU, NY, UCR).

3. ***Fellhaneropsis myrtillicola*** (Erichsen) Sérus. & Coppins, Lichenologist, 28(3): 199. 1996.

Type: Germany: Schleswig-Holstein, Lauenburg, im Sachsenwald bei Friedrichsruh, an *Vaccinium myrtillus* am Rande des Reviers Saupark, 2.xi.1924, *Erichsen* (HBG [n.v.], holotype).

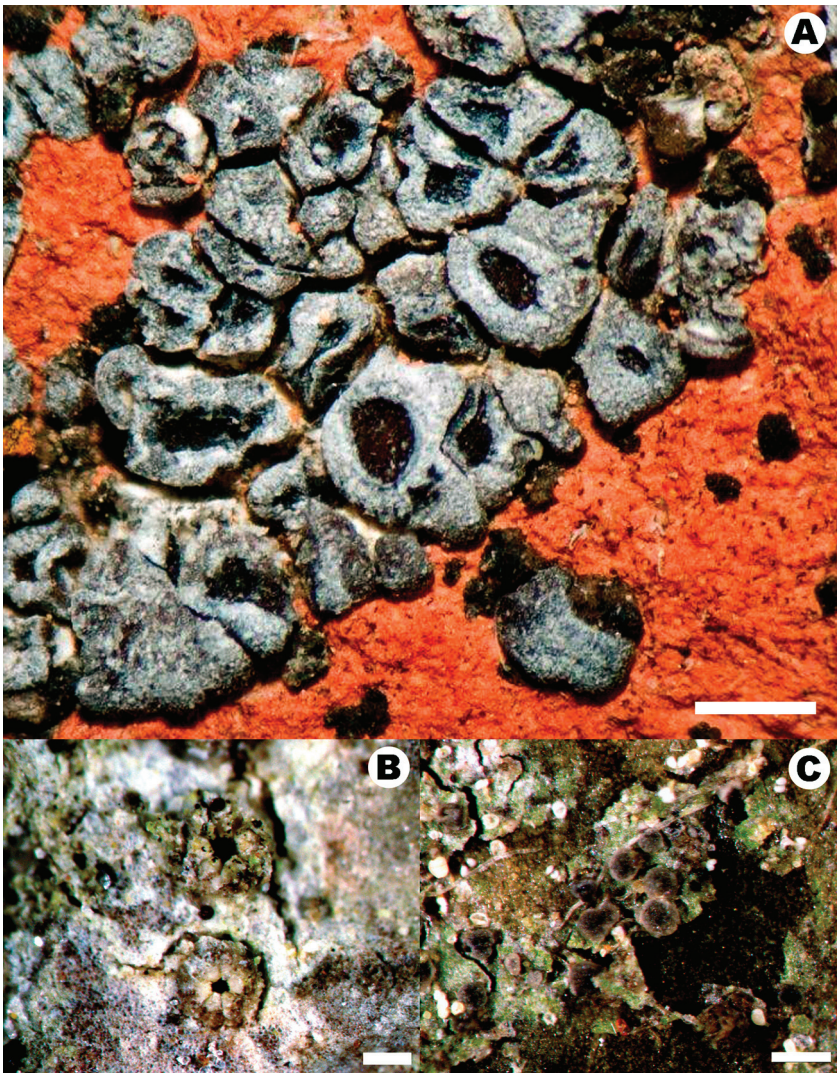

Figure 2. A, *Acarospora superfusa* (Freebury 999, scale = 0.5 mm). B, *Ramonia microspora* (Lendemer 20125, scale = 0.2 mm). C, *Fellhaneropsis myrtillicola* (Buck 50138, scale = 0.2 mm).

During the 2006 H.L. Bloomquist Foray, William Buck collected an interesting foliicolous lichen on *Rhododendron* leaves at the base of a waterfall at a high elevation site in the southern Appalachian Mountains. Foliicolous lichens

are not uncommon on evergreen leaves in high humidity microhabitats in this region; however they are only rarely collected. This collection remained unidentified until recently when Robert Lücking agreed to examine it and determined it to represent *Fellhaneropsis myrtillicola*. This is the first report of the species from North America and at his request we are publishing it here.

Fellhaneropsis Sérus. & Coppins resembles *Fellhanera* Vězda in most respects, differing in exciple type and in having filiform-sigmoid (vs. bacilliform) conidia (Sérusiaux 1996; Lücking 2008). Although *Fellhanera* species are common in the southern Appalachians, using the key provided by Harris & Lendemer (2009) none can easily be confused with *Fellhaneropsis* on account of the different conidia. *Fellhaneropsis myrtillicola* can be separated from other Pilocarpaceae in the region by its filiform-sigmoid conidia, 3-septate hyaline ascospores, and very small dark brownish-black convex immarginate apothecia. For a full description see Sérusiaux (1996). *Fellhaneropsis vezdae* (Coppins & P. James) Sérus. & Coppins has also been reported from western North America (Tønbserg 1997), however it differs from *F. myrtillicola* in having 5-septate ascospores.

Specimen examined— **U.S.A. North Carolina. Jackson Co.:** Nantahala National Forest, Panthertown Valley, vicinity of Schoolhouse Falls along Greenland Creek, 1190 m, hemlock-pine-hardwood forest with gneissic exposures, on *Rhododendron* leaves, 29.iv.2006, *Buck 50138* (NY).

4. ***Lecanora stramineoalbida*** Vain., J. Bot. 34: 35. 1896.

Type: Saint Vincent: Richmond Valley, *Elliott 239* (TUR-V 5582 [n.v.], holotype).

While collecting on Sapelo Island, Georgia, in December 2009, the first author collected an unusual *Lecanora* species with a dark (vs. hyaline) hypothecium on *Juniperus* in a dense coastal maritime forest. Using the revision of *Lecanora* species with dark hypothecia by Lumbsch et al. (1996) the collection keyed to *L. stramineoalbida*, a rare species from the West Indies. This is the first report of the species from North America. *Lecanora stramineoalbida* can be recognized by its corticolous habit, sessile apothecia, epihymenium with crystals that dissolve in K, brown K– hypothecium, and the production of 2'-0-methylperlatolic acid in addition to atranorin. For a full description refer to Lumbsch et al. (1996).

Specimen Examined— **U.S.A. Georgia. McIntosh Co.:** Sapelo Island, behind Nanny Goat Beach, on *Juniperus* branch, 15.xii.2009, *Lendemer 20785* (NY).

5. ***Ramonia microspora*** Vězda, Folia Geobot. Phytotax., 1: 162. 1966.

Type: Argentina. Jujuy Prov.: Laguna de la Brea, 1901, *R.E. Fries* (S [n.v.], holotype)

= *Biatorella rappii* Zahlbr., Ann. Mycol. 29: 82. 1931, **syn. nov.**
[non *Ramonia rappii* Vězda 1966].

Type: U.S.A. Florida. Seminole Co.: Mecca, xii.1923, on *Carpinus*, *Rapp* (W [n.v.], holotype; FLAS-27141!, isotype).

Ramonia microspora is a minute, easily overlooked, crustose lichen that is widespread throughout the Coastal Plain of southeastern North America. For a full description see Vězda (1966). It can be distinguished from other species of *Ramonia* using the key to the genus provided by Lendemer & Knudsen (2008). Recently Richard Harris pointed out that the type of *Biatorella rappii* is conspecific with *R. microspora*. Although *B. rappii* is the older name, the epithet "rappii" is preoccupied in *Ramonia* by *R. rappii* Vězda. Thus *B. rappii* should be placed in synonymy with *R. microspora*, and we do so here. A selection of specimens documenting the geographic distribution of this species in North America is provided below.

Specimens examined— **U.S.A. Arkansas. Franklin Co.:** Ozark National Forest, Boston Mountain Ranger District, Shores Lake, 17.x.2005, *Harris 51759-A* (NY). **Georgia. Candler Co.:** Charles Harold TNC Preserve, 22.xii.2009, *Lendemer et al. 21756* (NY). **Pierce Co.:** Little Satilla Wildlife Management Area, 21.xii.2009, *Lendemer et al. 21515* (NY). **Louisiana. East Baton Rouge Parish:** Burden Research Plantation, 16.v.1979, *Tucker 18603-A* (NY). **Missouri. Butler Co.:** Big Cane Conservation Area, 23.x.2001, *Harris 45255* (NY). **North Carolina. Camden Co.:** Dismal Swamp State Park, 10.xii.2009, *Lendemer 20125 & Williams* (NY). **Carteret Co.:** Bogue Banks, Theodore Roosevelt Natural Area, 20.iii.2003, *Buck 43860* (NY). **Jones Co.:** Croatan National Forest, Catfish Lake South Wilderness, 17.iii.2003, *Buck 43723* (NY). **Pender Co.:** Holly Shelter Game Land, 18.iii.2003, *Buck 43757* (NY). **South Carolina. Aiken Co.:** Savannah River Bluffs Heritage Preserve, 13.iii.2010, *Harris 55994-A* (NY), *Lendemer 21954* (NY).

Acknowledgments

We thank our reviewers, Alan Fryday and M. Gökhan Halici. For the loan of specimens we thank the curators of F, FH, KANU, KRAM and UPS as well as A. Flakus (Poland) and Bruce McCune (Oregon State University).

Literature cited

Clauzade G, Roux C, Rieux R. 1981 [1982]. Les *Acarospora* de l'Europe occidentale et de la region méditerranéenne. Bulletin du Musée d'Histoire Naturelle de Marseille 41: 41–93.

Egan RS. 1987. A fifth checklist of the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada. The Bryologist 90(2): 77–173. doi:10.2307/3242609

Fink B. 1899. Contributions to a knowledge of the lichens of Minnesota, IV. Lichens of the Lake Superior Region. V. Lichens of Minnesota Valley and southwestern Minnesota. Minnesota Botanical Studies 18–19: 215–329.

Harris RC, Lendemer JC. 2009. The *Fellhanera silicis* group in eastern North America. Opuscula Philolichenum 6: 157–174.

Knudsen K. 2007 [2008]. *Acarospora* In: Nash III, TH, Gries, C, Bungartz, F. (eds.). Lichen Flora of the Greater Sonoran Region, Vol. 3. Lichens Unlimited, Arizona State University, Tempe, Arizona, pp. 1–38.

Knudsen K, Morse CA. 2009. *Acarospora nicolai* (*Acarosporaceae*), a rediscovered species. The Bryologist 12: 147–151. doi:10.1639/0007-2745-112.1.147

Lendemer JC, Knudsen K. 2008. *Ramonia vermispora*, a new species from the Sonoran Desert region of southwestern North America. Opuscula Philolichenum 5: 83–88.

Lücking R. 2008. Foliicolous Lichenized Fungi Flora Neotropica Monograph, 103. Published by The New York Botannical Garden Press, 866 pp.

Lumbsch HT, Guderley R, Elix JA. 1996. A Revision of Some Species in *Lecanora* Sensu Stricto with a Dark Hypothecium (*Lecanorales, Ascomycotina*). The Bryologist 99(3): 269–294. doi:10.2307/3244300

Magnusson AH. 1924. New species of the genus *Acarospora*. Svensk Botanisk Tidskrift 18: 329–342.

Magnusson AH. 1929. A monograph of the genus *Acarospora*. Kungl. Svenska Vetenskaps-Akademiens Handlingar, Stockholm, ser. 3, 7(4): 1–400.

Magnusson AH. 1930. The lichen genus *Acarospora* in New Mexico. Meddelelser fran Göteborgs Botaniska Trädgard 5: 55–72.

Magnusson AH. 1956. A second supplement to the monograph of Acarospora with keys. Goteborgs Kungl. Vetensk.- & Vitterhets.-Samhalles Handl., sjatte foljden ser. B 6(17): 1–34.

Sérusiaux E. 1996. Foliicolous lichens from Madeira, with the description of a new genus and two new species and a world-wide key of foliicolous *Fellhanera*. The Lichenologist 28(3): 197–227. doi:10.1006/lich.1996.0019

Tønsberg T. 1997 [1998]. Additions to the lichen flora of North America VI. The Bryologist 100(4): 522–524. doi:10.2307/3244417

Vězda A. 1966. Flechtensystematische Studien III. Die Gattungen *Ramonia* Stiz. und *Gloeolecta* Lett. Folia Geobot. Phytotax. 1: 154–175. doi:10.1007/BF02989091